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# ALLIED APPROACHES TO THE REVOLUTION IN MILITARY AFFAIRS

***Britain, France, Germany and Australia***

by

Dr. Elinor C. Sloan

February 1999

OTTAWA, CANADA

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OTTAWA, CANADA February 1999

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## ABSTRACT/RÉSUMÉ

This paper looks at the British, French, German and Australian approaches to the US-driven Revolution in Military Affairs (RMA). It concludes that there are many common themes to how these countries are responding to the RMA. Technologically, all countries are investing in unmanned aerial vehicles for intelligence and reconnaissance; advanced, interoperable command, control and communications capabilities; and precision-guided munitions. Organizationally, all are creating a more professional, highly trained force. Those countries with professional forces are reducing reserve levels, increasing their training and reversing reductions in regular force levels. Those countries with conscript militaries are reducing personnel levels and eliminating or drawing back conscription. Doctrinally, all countries are emphasizing increased jointness and combinedness, as well as lighter, more rapidly mobile yet lethal forces. These moves are designed with a view to creating an expeditionary capability that can respond effectively to the unpredictable threats and risks of the coming decades. Thus while there is a common perception that measures to pursue the RMA are unsuited or irrelevant to the kinds of missions Western forces are most likely to face, in fact the opposite is true. Britain, France, Germany and Australia are all investing in those aspects of the RMA that are best suited to the nature of the new international security environment.

Ce document examine les approches que la Grande-Bretagne, la France, l'Allemagne et l'Australie ont adoptées à l'égard de la Révolution dans les affaires militaires (RAM) dirigée par les États-Unis. Il conclut que les façons dont ces pays réagissent à la RAM présentent de nombreux thèmes communs. Du point de vue technologique, ils investissent tous dans des véhicules aériens télépilotés aux fins du renseignement et de la reconnaissance, des moyens perfectionnés de commandement, de contrôle et de communications interopérables, ainsi que des munitions à guidage de précision. Sur le plan organisationnel, tous créent des forces plus professionnelles et mieux formées. Les pays qui disposent de forces professionnelles réduisent le nombre de réservistes et veillent à ce que ceux qui restent soient mieux entraînés. Par ailleurs, ils cessent de réduire les effectifs de la force régulière et même les augmentent. Les pays qui ont des armées de conscrits diminuent les niveaux de personnel et éliminent ou réduisent la conscription. Sur le plan doctrinal, tous veulent accroître leur capacité de mener des opérations interarmées et interalliées et mettent sur pied des forces plus légères et plus mobiles mais qui disposent d'armes meurtrières. Ces démarches visent à créer une capacité expéditionnaire qui peut réagir efficacement aux menaces et aux risques imprévisibles des prochaines décennies. Par conséquent, même s'il existe une perception commune selon laquelle les mesures prises dans le cadre de la RAM ne conviennent pas ou ne s'appliquent pas aux genres de missions que les forces occidentales sont le plus susceptibles de remplir, c'est en fait le contraire qui est vrai. La Grande-Bretagne, la France, l'Allemagne et l'Australie investissent toutes dans les aspects de la RAM qui sont le mieux adaptés à la nature du nouveau cadre de sécurité international.

## SOMMAIRE

1. La Grande-Bretagne, la France, l'Allemagne et l'Australie entreprennent certains aspects de la Révolution dans les affaires militaires (RAM) dirigée par les États-Unis. Lorsqu'on considère l'approche du Canada, il est utile de comprendre comment ces pays font face à des défis similaires.

### La Grande-Bretagne et la RAM

2. Au cours des dernières années, la Grande-Bretagne a pris plusieurs mesures qui sont compatibles avec la RAM. Bon nombre d'entre elles sont mises de l'avant dans le *Strategic Defence Review* (SDR) de juillet 1998, où il est question notamment d'améliorer les moyens de la Grande-Bretagne dans les domaines du renseignement, de la surveillance et de la reconnaissance, ainsi que ceux du commandement, du contrôle et des communications. La Grande-Bretagne se tourne vers les véhicules aériens télépilotés pour la surveillance, de même que les radars aéroportés. Pour ce qui est du commandement et du contrôle, elle met l'accent sur les technologies lui permettant de fonctionner efficacement lors d'opérations multinationales.

3. La Grande-Bretagne met sur pied des forces expéditionnaires afin de projeter sa puissance dans le cadre d'opérations de maintien de la paix et d'imposition de la paix. Une partie de ce processus consiste à augmenter les ressources de transport stratégique, notamment grâce à l'acquisition de nouveaux aéronefs de transport, porte-avions et porte-conteneurs rouliers. On s'affaire à améliorer la capacité de déploiement rapide de l'armée de terre en restructurant ses unités pour en faire des brigades plus souples et mobiles et en réduisant le nombre de ses chars de combat principaux. La Grande-Bretagne est en train de créer une force de réaction rapide interarmées à l'aide d'unités des trois services. Cette force sera sous commandement et contrôle interarmées; elle fera appel à des capacités de renseignement interarmées et disposera de services de logistique également interarmées. Afin d'accroître la puissance de feu et la mobilité des unités de l'armée de terre, la Grande-Bretagne fait l'acquisition de munitions à guidage de précision. La Royal Navy met l'accent sur la guerre de littoral et la projection de force pour appuyer les opérations terrestres. De plus, elle réduit sa force de sous-marins d'attaque à propulsion nucléaire et l'équipe de missiles conçus pour l'attaque d'objectifs terrestres.

4. La RAM indique qu'on opte davantage pour une force professionnelle mieux formée. Tandis que la force régulière de la Grande-Bretagne conservera un niveau relativement constant (le nombre de réguliers augmentera légèrement au sein de l'armée de terre britannique), l'armée territoriale sera réduite de plus de 25 %. Les unités qui resteront doivent être entièrement dotées, formées et équipées de sorte qu'elles puissent être rapidement intégrées à des éléments de la force régulière.

### La France et la RAM

5. La France apporte des changements majeurs à son système militaire, changements qui sont conformes aux théories relatives à la RAM. Le plus spectaculaire est la décision d'éliminer la conscription et de professionnaliser les forces armées françaises. Dans le cadre de ce processus de professionalisation, les forces armées subissent une importante réduction du potentiel militaire, des

brigades et régiments de la réserve sont dissous et les réservistes sont formés afin de renforcer les unités de la force régulière en tant qu'individus plutôt qu'unités. En outre, l'armée français est réorganisée autour de quatre forces : une force blindée, une force mécanisée, une force blindée d'intervention rapide et une force d'assaut d'infanterie. La nouvelle organisation permettra la constitution de modules de différentes tailles pouvant être réunis en diverses combinaisons selon les circonstances. Ce concept de «modularité» s'étend aux autres services, l'idée consistant à créer une force polyvalente qui soit capable de mener des opérations interarmées et interalliées.

6. La France est en train de mettre sur pied une force d'action rapide de 50 000 à 60 000 soldats qui pourront être déployés rapidement dans le monde entier. Sa création exige non seulement de professionnaliser et de réorganiser les forces militaires, mais aussi de fournir aux unités de l'équipement nouveau, plus léger, plus perfectionné et à effet létal. missiles and helicopter-borne radar. Le matériel principal comprend des chars, des véhicules blindés de combat d'infanterie, des hélicoptères d'attaque, des missiles antichars et des radars héliportés. La France veut en outre assurer l'interopérabilité entre ses services et avec ses alliés. Un élément clé de ce processus constitue l'acquisition de moyens perfectionnés de commandement et de contrôle interopérables. L'armée de terre est en voie de créer un quartier général interarmées capable d'assumer le commandement de forces françaises ou alliées.

7. Dans le domaine de la technologie, la France cherche surtout à améliorer ses capacités de renseignement, de surveillance et de reconnaissance grâce aux satellites et aux véhicules aériens télépilotés. Elle a également mis en oeuvre un processus (similaire à celui des États-Unis) qui vise à «numériser» son armée de terre. De plus, elle manifeste beaucoup d'intérêt pour les systèmes d'attaque de précision à distance de sécurité et les a placés «parmi ses priorités les plus grandes en matière d'équipement».

**L'Allemagne et la RAM**

8. Ces dernières années, l'Allemagne a pris des mesures qui correspondent aux tendances propres à la RAM. Sur le plan technologique, elle met l'accent sur les systèmes perfectionnés de renseignement, de surveillance et de reconnaissance, plus particulièrement les appareils de reconnaissance sans pilote.

9. Sur le plan doctrinal, l'Allemagne a créé une force de réaction d'urgence d'environ 50 000 soldats venant d'unités des trois services. Cette force participera à des activités de gestion de crises à l'échelle internationale. Pour accroître la mobilité de ses troupes, l'Allemagne fait l'acquisition de nouveaux véhicules de combat plus légers et munis d'une puissance de feu et d'une capacité de survie accrues, ainsi que d'autres aéronefs de transport stratégique.

10. Pour se doter d'un potentiel de guerre expéditionnaire, l'Allemagne doit entre autres réduire considérablement la taille de ses forces. Par contraste avec les tendances organisationnelles plus communes de la RAM, l'Allemagne projette de conserver son système de conscription universelle. Cela dit, d'ici l'an 2000, 60 % des militaires allemands seront des volontaires et la force de réaction rapide sera composée entièrement de professionnels.

**L'Australie et la RAM**

11. L'Australe s'efforce délibérément de mettre l'accent sur la RAM, en particulier au chapitre de la collaboration avec les États-Unis. Le document intitulé *Australia's Strategic Policy* (décembre 1997) place la RAM en tête des priorités relatives à l'élaboration de la structure de la force de défense australienne. L'Australie améliore son accès aux capacités de surveillance spatiale et fait l'acquisition de véhicules aériens télépilotés à grande autonomie. Elle a entrepris un important programme de 15 ans afin d'harmoniser diverses initiatives des services dans les domaines du commandement, du contrôle, des communications, de la surveillance et de la recherche du renseignement. L'Australie s'intéresse également à la technologie des armes de précision et achète des armes d'attaque à grande distance de précision pour ses avions d'attaque.

12. L'Australie est en train de mettre sur pied des forces terrestres plus souples et plus mobiles qui sont équipées de munitions et de plate-formes perfectionnées. Le document *An Australian Army for the 21st Century* fait état d'une nouvelle structure de force opérationnelle pour l'armée de terre australienne; il s'agit d'une force composée d'unités de combat dotées d'une mobilité accrue, d'une puissance de feu de précision et de capteurs perfectionnés. La mobilité doit être augmentée grâce à des hélicoptères pour le transport de troupes et a des véhicules blindés plus légers ayant une plus grande mobilité tout-terrain. Les forces opérationnelles sont conçues pour mener des opérations en compagnie des éléments de combat des autres services.

13. Les nouvelles forces opérationnelles de l'Australie doivent être formées à la fois de professionnels et de réservistes. Les militaires à temps partiel seront mieux équipés et mieux entraînés que par le passé et entièrement intégrés aux militaires à temps plein. La proportion de militaires à temps plein et à temps partiel dans une unité dépendra de la mission et de l'état de préparation.

**Conclusion**

14. Les façons dont la Grande-Bretagne, la France, l'Allemagne et l'Australie réagissent à la Révolution dans les affaires militaires présentent de nombreux thèmes communs. Du point de vue technologique, tous ces pays investissent beaucoup afin d'accroître leurs moyens de renseignement, de surveillance et de reconnaissance. Au coeur de ces efforts se trouvent les véhicules aériens télépilotés. En ce qui a trait au contrôle de l'espace de bataille, l'accent est mis sur les systèmes perfectionnés de commandement, de contrôle et de communications dont l'interopérabilité est assurée entre les services et avec les alliés. En outre, chaque pays acquiert au moins une quantité limitée de munitions à guidage de précision.

15. Sur le plan organisationnel, l'un des thèmes clés réside dans le fait qu'on se dirige vers des forces dotées de militaires plus professionnels et mieux formés. Les pays qui disposent de forces professionnelles réduisent le nombre de réservistes et veillent à ce que ceux-ci soient mieux entraînés pour travailler efficacement au sein des unités de la force régulière. Par ailleurs, ils mettent fin à la réduction des effectifs de la force régulière. Les pays qui ont des conscrits diminuent les niveaux de personnel et éliminent ou réduisent la conscription. Tous s'affairent à réorganiser leurs forces

professionnelles de sorte qu'elles soient composées d'unités plus petites et modulaires qui peuvent être facilement combinées à d'autres unités pour former une force interarmées ou interalliée affectée à une tâche spécifique.

16. Sur le plan de la doctrine, peu d'indices nous laissent croire que l'une des prédictions les plus «futuristes» de la RAM, c'est-à-dire le recours au combat téléguidé au moyen de véhicules aériens télépilotés, sera confirmée avant 2020 ou 2025 environ. La Grande-Bretagne, la France et l'Australie projettent soit d'acheter de nouveaux avions d'attaque, soit de moderniser leurs ressources actuelles. Cela dit, ces pays tenteront peut-être de se couvrir en réduisant le nombre d'aéronefs pilotés qu'ils achètent et en attribuant des contrats pour déterminer la possibilité d'utiliser dans l'avenir des engins de combat télépilotés.

17. Tous les pays veulent accroître leur capacité de mener des opérations interarmées et interalliées. Pour être en mesure de travailler avec les autres services et les alliés, on met l'accent sur l'acquisition de moyens de commandement, de contrôle et de communications interopérables et l'on vise à créer des unités qui peuvent être facilement regroupées et adaptées à une tâche précise.

18. Plus particulièrement, tous les pays mettent sur pied des forces plus légères et plus mobiles mais meurtrières. La Grande-Bretagne est en train de créer une force de réaction rapide interarmées, la France, une force d'action rapide, l'Allemange, une force de réaction d'urgence, et l'Australie, une nouvelle structure de force opérationnelle. L'amélioration des moyens de renseignement, de surveillance et de reconnaissance, l'acquisition de munitions à guidage de précision, la réduction du nombre de chars de combat principaux, l'augmentation des ressources de transport stratégique, l'importance accordée àr la capacité de mener des opérations interarmées et interalliées ainsi que la création de forces professionnelles découlent toutes dans une large mesure, sinon principalement, du désir de créer une **capacité expéditionnaire** qui puisse réagir aux menaces et aux risques imprévisibles des prochaines décennies. Par conséquent, malgré la perception courante selon laquelle les mesures prises dans le cadre de la RAM ne conviennent pas ou ne s'appliquent pas aux genres de missions que les forces occidentales sont le plus susceptibles de remplir, c'est en fait le contraire qui est vrai. La Grande-Bretagne, la France, l'Allemagne et l'Australie attachent toutes beaucoup d'importance aux aspects de la Révolution dans les affaires militaires qui se prêtent le mieux à la nature du nouveau cadre de sécurité international.

## EXECUTIVE SUMMARY

1. Britain, France, Germany and Australia are undertaking selected aspects of the United States-led Revolution in Military Affairs (RMA). In thinking about Canada's own approach, it is useful to understand how these countries are responding to similar challenges.

### Britain and the RMA

2. Over the past few years Britain has undertaken several measures that are consistent with the RMA. Many of these are being advanced by the July 1998 *Strategic Defence Review* (SDR) which emphasises improving Britain's capabilities in the areas of intelligence, surveillance and reconnaissance, as well as command, control and communications. Britain is looking to unmanned aerial vehicles (UAVs) for surveillance, as well as to airborne radar aircraft. For command and control, it is focusing on technologies that enable it to work effectively in multinational operations.

3. Britain is creating expeditionary forces for power projection in peacekeeping and peace enforcement operations. Part of this process is an increase in strategic lift capabilities, including new transport aircraft, aircraft carriers and roll-on/roll-off container vessels. The Army's rapid deployment capability is being improved by restructuring its units into more flexible, mobile brigades and reducing its number of main battle tanks. Britain is creating a Joint Rapid Reaction Force using units from all three services. It is to be under joint command and control, draw on joint intelligence capabilities and have joint logistics. To increase the firepower and mobility of Army units, Britain is acquiring precision-guided munitions. The Royal Navy is focusing on littoral warfare and force projection in support of land operations. Its nuclear powered attack submarine force is being reduced and equipped with land attack cruise missiles.

4. The SDR signals a shift towards a more highly trained professional force. Although Britain's regular force will remain at essentially constant levels (with a modest increase in the British Army's regular strength), the territorial army will be cut by more than 25%. Remaining territorial army units are to be fully manned, trained and equipped to the standards needed to be quickly incorporated into regular force elements.

### France and the RMA

5. France has set in train significant changes in its military system that are consistent with theories about the RMA. The most dramatic is the decision to eliminate conscription and professionalize the French armed forces. As part of the professionalization process, the French military is undergoing a significant force level reduction, reserve brigades and regiments are being disbanded, and reservists are being trained to augment regular force units as individuals, rather than units. In addition, the French Army is being reorganized around four forces: one armoured force, one mechanized force, one rapid intervention armoured force and one infantry assault force. The new organization will permit the constitution of modules of different sizes that can be brought together in varying combinations depending on the circumstances. This notion of

"modularity" extends to the other services, with the idea of creating a versatile force capable of joint tailoring and combined operations.

6. France is creating a Rapid Action Force of between 50,000 and 60,000 troops to be quickly deployable around the world. Establishing the force involves not only professionalizing and reorganizing the military but also furnishing units with new, lighter, more advanced and lethal equipment. Major items include new tanks, armoured infantry fighting vehicles, attack helicopters, anti-tank missiles and helicopter-borne radar. France is also focusing on ensuring interoperability among its services and with its allies. Key to this process is acquiring advanced, interoperable command and control capabilities. The Army is creating a Joint Command Headquarters able to take command of French or Allied forces.

7. In the area of technology, France is placing primary emphasis on improving its intelligence, surveillance and reconnaissance capabilities with satellites and UAVs. It is also carrying out a process, similar to that of the United States, of "digitalizing" its Army. Moreover, France has shown significant interest in stand-off precision strike systems and has placed them "among its highest equipment priorities."

**Germany and the RMA**

8. Over the past few years Germany has undertaken measures that are consistent with RMA trends. Technologically, Germany is focusing on advanced intelligence, surveillance and reconnaissance systems, especially unmanned reconnaissance aircraft.

9. Doctrinally, Germany has created a Crisis Reaction Force of about 50,000 troops organized from units of all three services to participate in international crisis management activities. To increase troop mobility Germany is acquiring new, lighter combat vehicles with greater firepower and survivability, and additional strategic transport aircraft.

10. Part of Germany's move towards an expeditionary warfare capability involves a significant reduction in the size of its forces. In contrast to the more common organizational trends of the RMA, Germany plans to retain its system of universal conscription. That said, by the year 2000, sixty percent of Germany's military will be volunteer and the rapid reaction force will be manned entirely by professional forces.

**Australia and the RMA**

11. Australia is making a conscious effort to focus on the RMA, particularly as it relates to working with the United States. *Australia's Strategic Policy* (December 1997) places the RMA at the top the Australian Defence Force's force structure development priorities. Australia is improving its access to space-based surveillance capabilities and acquiring long-endurance unmanned aerial vehicles. It has undertaken a major, 15-year program to harmonize various service efforts in the fields of command, control, communications, surveillance and intelligence collection. Australia is also focusing on precision weapon technology, acquiring long-range

stand-off strike weapons for its strike aircraft.

12. Australia is creating more rapidly mobile and flexible ground forces equipped with advanced munitions and platforms. *An Australian Army for the 21st Century* outlines a new task force structure for the Australian Army made up of combat units "embedded" with greater mobility, precision firepower, and advanced sensors. Mobility is to be enhanced with helicopters for troop lift and new, lighter armoured vehicles with improved cross-country mobility. The task forces are being designed to operate jointly with the combat elements of the other services.

13. Australia's new task forces are to be manned by a mix of professional and reserve forces. The part-time component of the force is to be better equipped and trained than in the past, and wholly integrated with the full-time component. The proportion of full and part-time personnel in a unit will depend on its mission and readiness.

**Conclusion**

14. There are many common themes to how Britain, France, Germany and Australia are responding to the Revolution in Military Affairs. Technologically, all countries are investing significantly in measures to increase their intelligence, surveillance and reconnaissance capabilities. Central to these efforts is unmanned aerial vehicles. For battlespace control the emphasis is placed on advanced command, control and communications capabilities that are interoperable among services and allies. Each nation is also acquiring at least a limited number of precision-guided munitions.

15. Organizationally, a key theme is the move towards more professional, highly trained personnel. Those countries with professional forces are reducing reserve levels and ensuring they are more highly trained to operate effectively with regular force units. They are also halting—if not reversing—reductions in their regular force levels. Those countries with conscript militaries are reducing personnel levels and eliminating or drawing back conscription. All countries are reorganizing their professional forces such that they are made up of smaller, modular units that can be easily combined with other units to make up a task-specific joint or combined force.

16. Doctrinally there is little indication that one of the most "futuristic" predictions of the RMA—a move towards unmanned combat using unmanned combat aerial vehicles—will be borne out in the period to about 2020/2025. Britain, France and Australia are planning to either purchase new strike aircraft or upgrade their current capabilities. That said, they are also "hedging their bets" by reducing the number of manned aircraft they purchase and tendering contracts to determine the feasibility of unmanned combat vehicles in the future.

17. All countries are emphasizing increased jointness and combinedness. Both the focus on acquiring interoperable command, control and communication capabilities, and the move to create units that can be easily brought together and tailored for a specific task, are driven by the goal of being able to work with other services and with allies.

18. Most notably, all countries are creating lighter, more rapidly mobile yet lethal forces. Britain is establishing a Joint Rapid Reaction Force; France a Rapid Action Force; Germany a Crisis Reaction Force; and Australia a new task force structure. Improving intelligence, surveillance and reconnaissance capability, acquiring precision-guided munitions, reducing the number of main battle tanks, increasing strategic lift assets, emphasizing jointness and combinedness, and creating professional forces are all driven significantly, if not primarily, by the desire to create an **expeditionary capability** that can respond to the unpredictable threats and risks of the coming decades. Thus while there is a common perception that measures to pursue the RMA are unsuited or irrelevant to the kinds of missions Western forces are most likely to face, in fact the opposite is true. Britain, France, Germany and Australia are all placing significant emphasis on furthering those aspects of the Revolution in Military Affairs that are best suited to the nature of the new international security environment.

## INTRODUCTION

1. Over the past few years there has been much debate as to whether the world is undergoing a Revolution in Military Affairs (RMA). This term refers to a major change in the nature of warfare brought about by advances in military technology which, combined with dramatic changes in military doctrine and organizational concepts, fundamentally alter the character and conduct of military operations.

2. There have been many revolutions in military affairs over the course of history.[1] The current one, which many agree is in its early stages, includes, but is not limited to, the following elements:[2]

(a) *Technology.*

(i) Precision force (key technology: precision-guided munitions);
(ii) Battlespace awareness (key technologies: advanced surveillance aircraft, unmanned aerial vehicles and satellites);
(iii) Battlespace control (key technology: advanced command and control capabilities); and
(iv) Power projection (key technologies: stealth and unmanned combat vehicles).

(b) *Doctrine.*

(i) Increased jointness among services, and combinedness among countries, in almost all operations (interoperability especially important);
(ii) Smaller, more rapidly mobile and flexible forces;
(iii) Use of precision-guided munitions to replace concentration of mass with concentration of firepower;
(iv) A long-term move away from manned aircraft to unmanned aircraft, especially for reconnaissance but also increasingly for combat;
(v) A change in focus from warfare at sea to naval forces projecting power from the sea onto land in the context of littoral warfare; and
(vi) A move from platform-centric warfare to network-centric warfare.[3]

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[1] See, for example, Andrew F. Krepinevich, "Cavalry to Computer: The Pattern of Military Revolutions," *The National Interest* (Fall 1994): 30-42.

[2] For a more detailed discussion of the elements of the RMA, and the US role in it, please see my *United States and the Revolution in Military Affairs*, D Strat A Project Report 98/01, February 1998.

[3] Network-centric warfare places greater emphasis on the sensor and surveillance systems of a group of warships, submarines or aircraft—and thus their ability to operate together—than on the particular attributes of the platform itself.

(c) *Organization.*

(i) Smaller units that can be easily combined and tailored to specific tasks;
(ii) More decentralized, delayered decision-making as a result of greater warfighting capabilities being conferred on smaller combat formations; and
(iii) Professional, more highly educated service personnel.

3. The RMA is being driven by a number of factors. They include:

(a) advances in military technologies, notably in computers, telecommunications, sensors, and precision-guided munitions. These advances, in turn, are being driven by the information revolution in the civilian world;

(b) reductions in defence budgets that have brought about dramatic reductions in the size of military forces in Western countries;

(c) the resulting need to emphasize qualitative improvements to compensate for reduced numbers of forces;

(d) a strategic environment which, in contrast to that of the Cold War, is characterized by unpredictable threats and risks that are likely to allow little, if any, time for mobilization;

(e) the resulting need for forces to be able to respond rapidly to a wide spectrum of regional conflict scenarios, including intra- and inter-state conflicts; and

(f) a lower tolerance among Western nations for casualties.

4. In thinking about Canada's own perspective on the RMA, it is useful to understand how four of our closest allies—Britain, France, Germany and Australia—are responding to this US-led phenomenon.

## BRITAIN AND THE RMA

5. Over the past few years Britain has undertaken several measures that are consistent with the Revolution in Military Affairs. Beyond the factors noted above, a major incentive behind its efforts to respond to the RMA has been the desire to be able to provide an effective contribution to US-led international security operations, and thus to remain a serious and valued ally. Many of the resulting decisions have been captured and advanced by the *Strategic Defence Review* (SDR) released by Britain's Labour government in July 1998.

## Technology

6. **Battlespace awareness and control.** The SDR places particular emphasis on improving Britain's capabilities in the area of intelligence, surveillance and reconnaissance—that is, battlespace awareness—which it sees as "not only vital for combat operations but also increasingly important for many peace support operations."[4] Britain is looking in part to unmanned aerial vehicles for surveillance and reconnaissance. An additional area of focus is Britain's Airborne Stand-Off Radar (ASTOR) program, intended to provide its military with a high-altitude radar platform capable of gathering intelligence imagery at stand-off ranges in excess of 200 kilometres. ASTOR is a battlefield-surveillance radar system similar to America's Joint Surveillance Target Attack Radar System (JSTARS), but unlike the JSTARS (which is based on the Boeing 707 airliner) ASTOR is packaged to fit into a large business jet.[5] A final contractor choice is expected in 1999, with the Royal Air Force (RAF) planning on buying four or five ASTOR aircraft.[6] The Pentagon is offering London participation in the JSTARS radar upgrade as a route to fulfilling the ASTOR requirement.[7]

7. At the same time, the Army's battlespace awareness is to be enhanced by "digitalizing" the battlefield—that is, by equipping each soldier and vehicle with a small computer that displays a map of the battlefield overlaid with friendly and enemy positions and aircraft flight paths. The British Army's first battlefield digitalization systems are due to enter service in 2002.[8]

8. The SDR also emphasizes improved command, control and communications capabilities, or battlespace control.[9] Priority is placed on ensuring Britain's command and control arrangements enable it to work effectively in multinational operations, including NATO's new combined joint task forces, UN missions and ad hoc coalitions.[10] Britain plans to further develop its Joint Command System by providing a secure intranet for deployed operations. Other projected improvements involve upgrading satellite communications, extending Britain's Joint Tactical Information Distribution System and improving the joint capability of the Royal Navy's Command Support System.[11]

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[4] British Ministry of Defence, *Strategic Defence Review*, July 1998, para 81.

[5] Nick Cook, "US Work-Split on New Joint STARS Radar Satisfies UK ASTOR Bidders," *Jane's Defence Weekly*, 9 December 1998, p. 5.

[6] Douglas Barrie and David Mulholland, "US Firms Reach JSTARS Upgrade Work Share Pact," *Defense News*, 31 August to 6 September 1998, p. 1.

[7] Douglas Barrie and David Mulholland, "DOD May Derail Northrop Grumman Astor Bid," *Defense News*, 23-29 November 1998, p. 3.

[8] "British Army Begins Vehicle Digitalization Trial," *Jane's International Defense Review*, 8/1998, p. 15.

[9] SDR, para 82.

[10] Ibid.

[11] Ibid., para 149.

9. **Power projection.** Britain intends to increase its power projection capability in part by using stealth technology. Britain and the United States have cooperated on stealth technology for the past three decades. Most recently, Washington has offered to expand London's access to classified US stealth technology to include the successor aircraft to the RAF's *Tornado* strike interdiction aircraft. The outcome of the talks is expected to play a key role in the direction of Britain's Future Offensive Air System program to replace the *Tornado*.

**Doctrine**

10. **Expeditionary capability.** The SDR sets in train a shift from a continental European strategy to one of expeditionary forces for power projection in peacekeeping and peace enforcement operations.[12] In Britain's view, the most likely conflicts of the foreseeable future will not be confrontations between large, heavy forces, but regional contingencies ranging from large, near-combat peacekeeping operations to humanitarian missions.[13] Indeed, Britain anticipates continuing and perhaps growing calls for contributions to international peace support and humanitarian operations, some of which could be militarily very demanding.[14] British Defence Secretary George Robertson considers deployability to be key in such a security environment because "the crises no longer come to us; we must go to them."[15] Crises affecting British interests are likely to occur in places where no British forces are stationed, therefore requiring the ability to move forces to where they will be needed.[16]

11. Reflecting Robertson's view that future UK forces are likely to have to "go to the threat", strategic lift capabilities are to be significantly increased. For the Air Force, the SDR calls for Britain to acquire four large C17 aircraft "or their equivalent."[17] In October 1998, the Ministry of Defence detailed plans to acquire a short-term strategic capability by 2001, if not sooner, and contracts are currently in the tendering stage.[18] In the longer term, Britain plans to replace its remaining aging transport aircraft, perhaps with the European Future Large Aircraft.[19] Belgium, Britain, France,

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[12] John D. Morrocco, "UK Reshapes Strategy for Force Projection," *Aviation Week and Space Technology*, 13 July 1998, p. 26.

[13] Gordon Adams, "British Set Example of Focused Strategic Defense Review," *Defence News*, 17 to 23 August 1998, p. 15.

[14] SDR, para 45.

[15] UK Defence Secretary George Robertson, Intervention at NATO Defence Ministerial, Vilamoura, Portugal, 25 September 1998.

[16] Colin McInnes, "Strategic Mobility: An Historical Perspective," *RUSI Journal*, August 1998, p. 30.

[17] SDR, para 96.

[18] Damian Kemp, "UK Details Short-Term Strategic Airlift Plans," *Jane's Defence Weekly*, 7 October 1998, p. 15.

[19] SDR, paras 96 & 147.

Germany, Italy, Spain and Turkey are participating in the aircraft's development program, headed by France's Airbus Industrie.[20]

12. For the Navy, two new aircraft carriers, with displacements between 30,000 and 40,000 tons and the capacity to carry up to 50 fixed wing aircraft and helicopters, will be built by about 2015 to replace its three 20,000 ton *Invincible*-class carriers, each of which carries a maximum of only 24 aircraft.[21] In Robertson's view, the acquisition of two larger aircraft carriers, combined with current maritime assets, will "give us a fully independent ability to deploy a powerful combat force to potential trouble spots, without waiting for basing agreements on other countries' territories. We will be able to be poised in international waters and effectively back up diplomacy with the threat of force."[22]

13. The Navy will also see the number of its roll-on/roll-off container vessels increased from two to six. Until now, Britain has had to rent commercial ships to deploy forces overseas, slowly loading and unloading them by crane. The new vessels, two of which entered service in 1998, will be available at short notice to transport heavy equipment, even in situations where sophisticated port facilities may not be available.[23] They will significantly increase the rapid deployment capability of the Army since each roll-on/roll-off vessel can carry half a division of troops, as well as 25 main battle tanks and 24 light armoured vehicles such as personnel carriers and reconnaissance vehicles.[24]

14. The Army's rapid deployment capability is also being improved by restructuring its units into more flexible, mobile brigades.[25] The SDR concluded that Britain's current armoured regiments are smaller than the ideal and, in particular, do not contain sufficient manpower for some roles. Whereas yesterday's ground forces were structured for a short, high-intensity war in Germany, today's forces may be deployed overseas for several months or longer.[26] To increase sustainment capabilities, the current eight regiments are being replaced with six larger regiments of about 600 personnel.[27] Two of these regiments will be given new roles in keeping with today's security environment. One will form part of Britain's new joint biological and chemical defence capability (see below), while the

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[20] Gregor Ferguson and Michael Witt, "Activity Heats Up in Military Transport Market," *Defense News*, 20 April 1998, p. 16.

[21] "UK Strategic Defence Review Bolsters the Reach of British Armed Forces," *Jane's International Defense Review*, 8/1998, p. 5.

[22] Michael Witt, "Conservatives Fault SDR Calls For Budget Cuts," *Defense News*, 13 July 1998, p. 1.

[23] Michael O'Hanlon, "UK Review Gets it Right: British Strategy Will Boost Power Projection," *Defense News*, 20 July 1998, p. 33.

[24] Michael Witt, "British Reform to Shift Procurement Executive," *Defense News*, 3 August 1998, p. 12.

[25] Adams, p. 15.

[26] McInnes, p. 33.

[27] SDR, para 113.

other will become a new armoured reconnaissance regiment.[28] Britain's commitment to the UN peacekeeping operation in Bosnia revealed the need for more of such reconnaissance units.[29]

15. Although British armoured regiments are to become larger, they will also be more strategically mobile with a reduction in the number of their main battle tanks. Reflecting the shift from a massive Cold War front line to smaller regional conflicts, each of the six new armoured regiments will hold only 30 tanks for peacetime training, substantially less than the 38 tanks that had previously been planned and roughly half the 57-tank strength of each armoured regiment in 1990.[30] The army's main battle tank fleet is thus being cut from the fifth largest in Western Europe in 1990, to roughly 11th in size once the SDR's provisions have been implemented.[31] Notably, however, the fleet will be made up of the new *Challenger* 2 tank, exemplifying the Army's decision to retain its ability to conduct high-intensity warfare.[32]

16. **Jointness**. Central to Britain's plans for increasing its expeditionary capability is the creation of a Joint Rapid Reaction Force (JRRF). This pool of "powerful and versatile" units from all three services is to be operational by 2001.[33] The forces are to be available in two echelons of "very high" and "high" readiness, and will include roughly four ground force brigades, 20 major warships and 22 other vessels, 110 combat aircraft and 160 other aircraft.[34] It will also include a highly mobile air-manoeuvre brigade once the *Apache* attack helicopter enters service.[35] The number of ships, battalions, aircraft and other units that will make up any particular force package will depend on the military task at hand. The JRRF is to be under joint command and control, draw on joint intelligence capabilities and have joint logistics.

17. The SDR argues that by 2015 there will be a major change in the methods of warfare. "Operations will no longer be characterised as land, sea or air. There will instead be a single battlespace in which land, maritime and air forces will be directed, targeted and supplemented by a new generation of intelligence, surveillance, information and communications systems offering a step change in military capability. But to take advantage of this we will need to evolve new ways of

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[28] Ibid., para 114.

[29] Ian Kemp and Christopher Foss, "British Army Armoured Fighting Vehicles—Future Force," *Jane's Defence Weekly*, 3 June 1998, Vol. 29, No. 22.

[30] SDR, para 113.

[31] Kemp and Foss.

[32] Ibid.

[33] SDR, para 92.

[34] Michael Codner, "The Strategic Defence Review: How Much? How Far? How Joint is Enough?" *RUSI Journal*, August 1998, p. 7.

[35] SDR, para 112.

organizing."[36] In line with this analysis, the SDR sets in train the creation of several new joint organizations:[37]

- A Joint Helicopter Command will merge the roughly 400 combat and combat support helicopters of all three services, including the Navy commando, army attack and RAF combat support helicopters, as well as the Army's *Apache Longbow* attack helicopter once it enters service. The idea here is to achieve maximum operational effectiveness by bringing all battlefield helicopters together into a single command.[38] Helicopters employed for anti-submarine warfare, maritime early warning and search and rescue will remain separate from the new Joint Command;

- A joint Army/Air Force ground-based air defence organization will be created, merging the services' existing missile units. A joint training school for air defence is to be established in 1999 and a joint headquarters by 2002;

- A joint carrier-borne aircraft organization, dubbed Joint Force 2000, will be established to merge Navy and Air Force *Harrier* jets. Currently the Navy's *Sea Harrier* is employed in the air defence role from its *Invincible* class carriers, while the RAF's *Harrier* is optimized for strike missions. Joint Force 2000 aims to create a joint *Harrier* force that can operate equally effectively from aircraft carriers and land bases, and is capable of both attack and air defence missions. The US Joint Strike Fighter is being considered as a single replacement aircraft for both the Navy and Air Force *Harrier* forces[39];

- A new post of Chief of Defence Logistics is being created to assume overall control of the three separate logistics organizations currently supporting the Navy, Army and Air Force, and to develop them into a single organisation;[40]

- A joint Army/Air Force nuclear, biological and chemical defense unit is to be created; and

- A new Joint Defence Centre will be established to develop doctrine for training and operations, as well as future equipment requirements.

18. **Concentration of firepower versus concentration of mass.** The SDR also emphasizes moving from the concentration of mass to the concentration of firepower using precision-guided

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[36] Ibid., para 206.

[37] Morrocco, p. 26.

[38] SDR, para 97.

[39] Codner, p. 8.

[40] SDR, para 178.

munitions. For army units to become more deployable and mobile on the battlefield, it argues, the Army "will need to exploit to the full new equipment entering service—notably 'smart' weapons."[41] To this end, the Army has launched the Indirect Fire Precision Attack program to increase the range and effectiveness of its future Army artillery systems.[42] The Air Force is also placing an increased premium on "stand-off" precision missiles which can be launched at targets from long range.[43] Finally, the Navy is focusing on concentrated firepower by equipping all of its nuclear submarines, and potentially some of its warships, with precision-guided cruise missiles (see below).

19. **Unmanned combat.** Current trends in UK defence policy are mixed as to whether Britain will undertake a long-term move from manned to unmanned aircraft for combat. The Future Offensive Air System program to replace the *Tornado* strike aircraft encompasses concept definition studies not only for a new manned aircraft, but also for unmanned combat air vehicles and conventional air-launched cruise missiles. British Defence Ministry and industry officials have said in the past that they consider combat UAV technologies to be most promising for the study.[44] Moreover, the SDR states that Britain will consider replacing the *Tornado* with stand-off missiles or unmanned aircraft,[45] and reduces the RAF's combat aircraft by some 23 offensive support and 13 air defence aircraft. That said, this reduction reflects more of a move away from the anti-shipping role, than towards unmanned combat. In addition, the SDR reaffirms the acquisition of 232 *Eurofighters*.[46] Most recently, the Commander of the Royal Air Force's Strike Command has argued that Britain is unlikely to opt for an unmanned combat air vehicle to meet its next generation strike aircraft requirement because such technology will not be ready to replace the *Tornado* in the timeframe necessary.[47]

20. **Littoral warfare.** In keeping with the new security environment, the Royal Navy is moving away from large scale maritime warfare and open-ocean operations in the North Atlantic, and towards littoral warfare and force projection in support of land operations. Such tasks could range from the evacuation of citizens from an overseas crisis, to major warfighting operations as part of a joint force.[48] The decision to purchase two new, large aircraft carriers for expeditionary operations

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[41] SDR, para 86.

[42] Christopher Foss, "British Army Sets Sights on Greater Accuracy," *Jane's Defence Weekly*, 18 February 1998, p. 13.

[43] SDR, para 87.

[44] Douglas Barrie and Theresa Hichens, "Stealth Talks May Hold Key to Britain's FOAS," *Defense News*, 31 August 1998, p. 3.

[45] SDR, para 146.

[46] Ibid., para 117.

[47] Douglas Barrie, "British Air Chief Sceptical About Feasibility of UCAV," *Defense News*, 30 November to 6 December 1998, p. 6.

[48] SDR, para 85.

itself represents a move away from the open ocean anti-submarine warfare mission which dominated the Royal Navy's thinking during the Cold War.[49] In addition, the nuclear powered attack submarine force will eventually be reduced from 12 to 10, and all 10 will be equipped with the land attack *Tomahawk* cruise missile.[50] High-ranking Navy officials have argued that the future frigate should also have a land-attack cruise missile capability to compliment the nuclear submarines.[51]

**Organization**

21. Although the Revolution in Military Affairs predicts smaller armed forces, this is best understood as a baseline taken from Cold War levels. Britain's 1990 "Options for Change" force structure review resulted in more than 30% cuts in the strength of the regular army and the territorial army (army reservists) and the withdrawal of more than half of Britain's forces in Germany.[52] Its tank fleet has been reduced by 45%, its submarine force by 57%, and its air forces are to be completely withdrawn from Germany by 2002.[53] As a result, the SDR does not call for any further reductions in the size of Britain's regular force. Indeed, the program actually represents an increase in active personnel numbers. Under the SDR's restructuring, the British Army's regular strength is set to increase by some 3,300 personnel in such critical areas as logistics and medical services. In addition, "there will be no change in the size of the regular infantry, which will continue to be in high demand."[54] Some 2,500 troops will move from Germany to the United Kingdom, but Britain will retain two deployable divisions, one based at home and the other in Germany.

22. The SDR does signal a shift towards a more highly trained force. Although the regular force will remain at essentially constant levels, the territorial army will be cut by more than 25%, from the present 56,000 to roughly 40,000 personnel. In fact, the Defence Staff calculated an operational role for only about 7,500 ground reserves, but the Government decided to retain the higher levels in order to maintain the traditional reserve force link with civilian communities.[55] The remaining territorial army units are to be integrated more closely into the new combat capability. Whereas the present force is largely made up of formed units at low readiness intended for the defence of the UK against invasion or to reinforce NATO in Germany, future territorial army units are to be "more readily deployable and usable"—that is, fully manned, trained and equipped to the standards needed to be

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[49] "SDR Signals a Sea Change for the Royal Navy," *Jane's Navy International*, October 1998, p. 15.

[50] SDR, para 116.

[51] Former Chief of Naval Staff Admiral Jock Slater, as quoted in Douglas Barrie, "UK Naval Emphasis Shifts to Shallow Waters," *Defense News*, 16-22 November 1998, p. 16.

[52] Kemp and Foss.

[53] SDR, para 110.

[54] Ibid., para 111.

[55] Codner, p. 8.

quickly incorporated into regular force elements.[56]

## FRANCE AND THE RMA

23. The Revolution in Military Affairs is a term which is rarely used in France. It does not shape public debate on defence and is only discussed within a limited circle of military and civilian defence experts.[57] Nonetheless, over the past few years France has set in train a number of significant changes in its military system that are consistent with theories about the requirements of the RMA.

24. David Yost, a French defence policy expert at the US Naval Post-Graduate School in Monterey, has argued that these changes have not been inspired by some "purposeful grand design" regarding the requirements of the RMA, but rather by a number of distinct events and perceived necessities.[58] They include:

- a desire on the part of France to define itself as a great power, to have as much national autonomy as possible from the United States, to honour its international obligations and to uphold its international rank and standing;

- "lessons learned" from the Gulf War, including the importance of satellite intelligence as well as the need to improve the French military's interoperability with principal allied forces, increase power projection capabilities and bring about a better balance between conscript and professional forces;

- the requirement to adapt to new geostrategic circumstances and especially to be able to carry out crisis intervention operations in regional contingencies; and

- economic and budgetary constraints, which made the cost of maintaining France's force posture unsustainable and subsequently led to France's rapproachment with NATO.

### Organization

25. On 23 February 1996 French President Jacques Chirac announced a long-term plan for downsizing and modernizing the French military. Known as "model 2015,"[59] Chirac's plan will be

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[56] SDR, para 109.

[57] François Géré, "RMA or New Operational Art? A View From France," paper presented at a conference on Defence and Security at the Dawn of the 21st Century, Sainte-Foy, Quebec, 2-4 October 1997.

[58] David Yost, *France and the Revolution in Military Affairs*, Unpublished Manuscript, 31 March 1997.

[59] Jean-Claude Mallet, "Stratégie et modèle d'armée 2015," *défense nationale* (juillet 1996), p. 24.

implemented through a series of three defence Program Laws,[60] the first of which—the Program Law for 1997 to 2002—was adopted by the French parliament on 2 July 1996.[61]

26. The most dramatic aspect of Chirac's announcement and of the subsequent Program Law is the decision, after over 200 years, to all but eliminate conscription and thus professionalize the French armed forces. The professional force of the future will rest on three complementary elements: career military personnel, young volunteers, and reservists.[62] By 2002, 92% of the French military will be professional, as compared to 59% in 1996.[63]

27. Key to professionalizing the French military is a significant reduction in force levels. By 2002, the French armed forces will have been reduced from a 1996 level of 500,000 to 357,000 personnel.[64] This represents a 28% reduction in force levels—a proportion that can be compared to the reduction in British force levels since 1990.[65] Of this figure the total reserve manpower will remain at 100,000 personnel, however rather than providing entire wartime units, reservists will be employed as individuals to augment regular force units. Accordingly, all reserve brigades and reserve regiments will be disbanded.[66]

28. As part of the professionalization process, French ground forces are undergoing a significant organizational transformation. In accordance with the Program Law, the French Army is being reorganized around four forces, each comprising about 15,000 men: one armoured force, one mechanized force, one rapid intervention armoured force and one infantry assault force.[67] The new organization will permit the constitution of modules of different sizes that can be brought together in varying combinations depending on the nature of the crisis to which they are responding.[68] This notion of "modularity" extends not only to the French Army, but also to the other services.[69] The idea is to create a versatile force capable of joint tailoring and combined operations.[70]

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[60] Jean-Philippe Douin, "Vers un nouvel équilibre entre les fonctions opérationnelles," *défense nationale* (juillet 1996), p. 58.

[61] Eugène-Jean Duval, "Aspects de la professionalisation des armées," *défense nationale* (octobre 1997), p. 101.

[62] Philippe Mercier, "Les armées et leurs équipements," *défense nationale* (juillet 1996), pp. 79-80.

[63] Jean-Philippe Douin, "Adapting French Defence to the New Geostrategic Context," *RUSI Journal* (August 1997), p. 2.

[64] Mercier, p. 80.

[65] Douin, "Adapting French Defence," p. 2.

[66] Ibid.

[67] Frédéric Drion, "France: New Defense for a New Millennium," *Parameters* (Winter 1996-1997), http://carlisle-www.army.mil/usawc/Parameters/96winter/drion.html

[68] 1996 Defence Program Law, http://www.defense.gouv.fr/ema/strategic/annexe.html, para 1.4.3.

[69] Mallet, p. 27.

[70] Drion.

29. France's decision to professionalize its armed force was based on the demands of future warfare and the nature of the post-Cold War security environment. The experience of the Gulf War demonstrated that the short-term military service of a conscript was no longer compatible with the high degree of technical proficiency, tactical and operational training and extensive experience required of military forces in the coming decades.[71] Moreover, it brought home the fact that France had very few high-quality professional forces to contribute to a coalition operation far from the Cold War's central front. Both during the Gulf operation, and later for the rapid reaction force that went into Bosnia in 1995, France could only deploy about 10,000 troops by "skimming off" professional soldiers for such duties.[72] Chirac recognized that the most likely challenges of the future would be interventionary operations far from home and that it would be necessary for France to have professional soldiers prepared to conduct such operations.

**Doctrine**

30. **Joint and combined operations**. The Program Law stresses the importance of increasing interoperability both among the French services and between France and its allies. Thus the French services are being reorganized with greater modularity so that their units can be more easily formed into a joint force and combined with elements of Britain's Rapid Reaction Force and Germany's Crisis Reaction Force (see below). Key to increasing interoperability among services and allies in the future will be advanced, interoperable command and control capabilities. The Army is creating multipurpose and deployable forces headquarters—one for each of the four new forces—that will be able to take command of a French or multinational force the size of a NATO Division. These four staffs will not have permanently assigned units under their control; rather, they will take command of whatever force is constructed for the particular task at hand.[73] The Army is also setting up a Joint Command Headquarters able to take command of French or Allied forces equivalent to the size of a NATO Corps.

31. These moves come on top of several organizational changes France made soon after the Gulf War to facilitate joint and combined operations:

- In 1992 it established a Special Operations Command to bring together the special operations forces of the army, navy and air force;
- In 1993, the government established a Joint Operational Planning Staff to prepare for engagements in Europe and beyond, with an emphasis on joint and coalition operations; and

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[71] Ibid.

[72] Yost, p. 17.

[73] Douin, "Adapting French Defence," p. 3.

- That same year, France established a new Joint Defense College which replaced the war colleges of the army, navy and air force. One of its goals is to make officers "familiar with inter-service and inter-allied modes of work."[74]

32. **Expeditionary capability**. The Program Law notes that the kinds of conflicts that France is likely to be confronted with in the future will require power projection for brief engagements using forces that are smaller in number but immediately available and operational.[75] To this end, France aims to have in place, by 2002, a Rapid Action Force of between 50,000 and 60,000 troops to be quickly deployable to areas around the world.[76] The idea is to be able to deploy 30,000 troops, partially sustainable, into a main theatre for up to one year, and another 5,000 troops, sustainable, to a secondary theatre.[77]

33. Creating this force will involve not only the professionalization, reorganization and jointness efforts noted above, but also furnishing the units with new, lighter, more advanced and lethal equipment. Major items include the *Leclerc* tank, the future armoured infantry fighting vehicle, the *Tigre* helicopter, new anti-tank missiles and the *Horizon* helicopter-borne radar.[78] The number of France's heavier main battle tanks will diminish by 60%.[79] The overall effect will be to move the French armed forces from a Cold War, central front, defensive operation to a rapid reaction military, characterized by flexibility and mobility. "Professionalization, with more advanced equipment and a smaller force, is expected to produce a military establishment more suited to France's needs: effective capabilities for power-projection and intervention in conflicts in and beyond Europe."[80]

34. For France, the overall objective is to increase the number of immediately deployable command and combat assets, and not strategic lift capabilities, which in its view would be available from allies or civilian support.[81] The Air Force is participating in the Future Large Aircraft development program headed by France's Airbus Industrie and is to retain its current air lift capacity at about 50 strategic transport aircraft. The Navy is to have a naval air group and an amphibious force deployable on demand and built around a nuclear powered aircraft carrier equipped with *Rafale* carrier-borne aircraft. This force, which will also include landing-craft barges, new anti-aircraft

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[74] Yost, pp. 10-11.

[75] 1996 Defence Program Law, para 1.4.1.

[76] Ronald Tiersky, "French Military Reforms and Strategy," *Strategic Forum* (National Defense University Institute for National Strategic Studies, November 1996), http://www.ndu.edu/ndu/inss/strforum/forum94.html

[77] Douin, "Vers un nouvel équilibre," p. 62.

[78] Drion.

[79] Douin, "Adapting French Defence," p. 2.

[80] Yost, p. 19.

[81] Douin, "Adapting French Defence," p. 3.

frigates and countermining ships, will figure in the Navy's power projection force.[82] Nonetheless, by the middle of the coming decade the French surface fleet is to be cut by one-third. Moreover, in stark contrast to Britain, which is building two new aircraft carriers by 2015, France has scaled back its carriers. Severe budget constraints have meant that the *Foch* is to be withdrawn from active service in late-1999, when the *Charles de Gaulle* is commissioned, rather than being placed in reserve in 2000. This means that there will be no aircraft carrier to stand in for the *Charles de Gaulle* when it undergoes refit in 2005-2007. It is also increasingly unlikely that a sister ship to the *Charles de Gaulle*, originally scheduled to enter service in 2012-2015, will actually be built.[83]

**Technology**

35. Although the most dramatic changes in the French military over the past few years involve organizational and doctrinal developments, France is also pursuing a number of technological advances that are consistent with the RMA. Indeed, the proportion of defence funds that France has invested in RMA-related technologies has increased since the late 1980s and particularly since the Gulf War.[84]

36. The Gulf War underscored most emphatically for France the value of space-based surveillance systems, especially for intelligence. Moreover, it highlighted the fact that France (like other allies) was largely dependent on US systems for obtaining such intelligence. Motivated by a political determination to be able to make independent intelligence assessments, French officials argued in the months following the Gulf War that France must develop an "autonomous capacity for space observation."[85] To this end, France followed its *Helios I* satellite with the *Helios II* infra-red satellite, set for deployment in 2001, and plans to launch its *Horus* radar satellite by 2005.[86] France is also increasing its battlespace awareness with UAVs. In 1995 it replaced its *MART* system, a mini-UAV it used during the Gulf War, with the more capable *Crecerelle*.[87] France plans to retain the *Crecerelle* in service until at least 2005, pending the entry into service of the *Brevel* 24-hour unmanned reconnaissance aircraft, which it is developing with Germany.[88]

37. France is enhancing the situational awareness of its ground troops by carrying out a process, similar to that of the United States, of "digitalizing" the Army. France has successfully deployed a

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[82] Drion.

[83] David Foxwell, "France Weighs up the Global Price," *Jane's Navy International*, 1 July 1998, p. 30.

[84] Yost, p. 9.

[85] Former French Defence Minister Pierre Joxe as quoted in ibid., p. 15.

[86] Douin, "Adapting French Defence," p. 2.

[87] "The Future of Unmanned Aerial Vehicles," *IISS Strategic Comments* (December 1997).

[88] Mark Hewish, "UAVs Acquire a View to a Kill," *Jane's International Defense Review*, 6/1998, p. 56.

battlefield management system in Bosnia since 1995,[89] and a new tactical telecommunications network will be delivered in 2000.[90] By 2005 it is intended that each French soldier will be equipped with the ability to detect targets by day and night to a range of 300 metres, identify friendly troops, use remote sighting to aim and fire from behind cover and transmit video data that is received on a helmet-mounted display.[91]

38. Beyond battlespace awareness, France has also shown significant interest in stand-off precision strike systems and has placed them "among its highest equipment priorities."[92] The French have developed the *Apache* family of air-launched cruise missiles, and are planning to procure 500 *Scalp* cruise missiles with a range of over 250 kilometres and one metre accuracy.[93]

## GERMANY AND THE RMA

39. Over the past few years Germany has undertaken some limited measures that are consistent with the technological, doctrinal and organizational trends of the RMA, but it has not focused on such initiatives to nearly the degree that have Britain and France. This is primarily because, for political reasons, the RMA has been a "non-issue" in Germany until quite recently. It was not until 1994 that Germany overcame its constitutional constraints to deploying forces beyond its borders, and it was not until 1995 that Germany actually undertook such a deployment (into Bosnia). Substantial political constraints remain and it is as yet unclear what role the new Social Democratic Party (SPD)-led government—headed by the first Chancellor without any historical memory of World War Two—will seek to play on the world stage. Soon after its election to office in September 1998, the government stated its intention to conduct a strategic review of defence requirements, similar to that undertaken by the Labour government in Britain.[94] Since that time, it has created a Commission for the Future of the ***Bundeswehr***, mandated to present proposals on all aspects of defence policy, including the size and structure of the armed forces, as well as current procurement decisions.[95]

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[89] Robert P. Grant, *The Revolution in Military Affairs and European Defense Cooperation* (Konrad Adenauer Foundation Arbeitspapier, June 1998), p. 26.

[90] "Communications Key to Changing Tactics," *Defense News*, 8-14 June 1998, p. 12.

[91] "France's Next-Century 'Soldier System' Debut," *Jane's Defence Weekly*, 10 June 1998, p. 11.

[92] Jean-Michel Boucheron, *Rapport Fait au Nom de la Commission des Finances* (Paris: Assemblé Nationale, 12 November 1997), pp. 122-123 as quoted in Grant, p. 26.

[93] Grant, p. 26.

[94] Michael A. Taverna, "Schroeder Team Sets Stage for New Course," *Aviation Week & Space Technology*, 19 October 1998, p. 73.

[95] Ben Lombardi, "German Security and Defence Policy," DND Directorate of Strategic Analysis briefing note for the 35th Munich Conference on Security Policy, 8 January 1999, p. 4.

**Technology**

40. Germany has focused to a significant degree on advanced intelligence, surveillance and reconnaissance systems. Since 1992 Germany has been working with France in developing the *Brevel* 24-hour unmanned reconnaissance aircraft.[96] At the same time, the German Army hopes to buy a number of lightweight and inexpensive UAV systems that can provide reconnaissance information directly to forward deployed forces.[97] The German Navy is participating the NATO program to develop a Maritime Unmanned Aerial Vehicle which would provide support for anti-surface warfare, electronic warfare, anti-ship missile defence, command, control and communications, amphibious operations and anti-submarine warfare. Of the three countries putting together the international technology demonstrator for this program (Britain, Germany and the United States) the German government has taken the firmest line in committing to a Maritime UAV.[98]

41. Although Germany is emphasizing the use of unmanned aerial vehicles in a supporting, surveillance role, there is little indication that it is moving towards unmanned combat vehicles or a doctrine of unmanned combat. Germany is developing the Eurofighter in collaboration with Italy, Spain and Britain and has 140 aircraft on order, with an option to purchase a further 40 optimized for the strike role. That said, one possible outcome of the Commission's review is that delivery of the first batch of aircraft will be stretched out, while the second batch may be scrapped altogether.[99]

**Doctrine**

42. Perhaps no Western military was less suited to the rapid deployment demands of the post-Cold War era than that of Germany. Four decades of preparing for a massive, predictable Soviet assault on the eastern border of West Germany meant that Germany had a military force with neither a rapid deployment capability, nor the logistical tail to support one. The conflict with Iraq drove home the realization at the Ministry of Defence that Germany was completely unable to deploy its forces outside of its own territory.[100] Germany's *Defence White Paper 1994* stressed that while the *Bundeswehr* had sufficient advanced equipment for the task of national defence, "what is still missing is an ability to participate effectively in international crisis management activities. There is a requirement for a German reaction force contingent capable of interacting with allies and of

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[96] "The Future of Unmanned Aerial Vehicles," *IISS Strategic Comments* (December 1997).

[97] Hewish, p. 56.

[98] "Shipborne UAVs Await Take-Off," *Jane's Navy International* (January/February 1998), pp. 40-41.

[99] Douglas Barrie and Jack Hoschouer, "Bundeswehr Review Looms," *Defense News*, 10 August 1998, p. 1.

[100] Brooks Tigner, "Command, Deployment Flexibility Take Priority," *Defense News*, 20-26 April 1998, p. 12.

covering the entire spectrum of possible missions."[101] To meet this requirement, Germany has created a Crisis Reaction Force of about 50,000 troops, organized from units of all three services, to be fully in place by the summer of 1999.[102] In contrast to Germany's Main Defence Force, which relies on significant warning time to mobilize and is manned in part by conscripts, the reaction force is kept at full strength and consists entirely of volunteers. Reaction force units form the German contingent of NATO's peacekeeping force in Bosnia.[103]

43. Despite these initiatives, defence experts argue that more needs to done. "The Bundeswehr is still structured to fight the Cold War. Today's missions, largely coalition operations, require lighter, more agile forces."[104] Key force requirements for such a capability are lighter vehicles, transport helicopters, strategic lift capabilities and information technologies to facilitate command and control among dispersed units. Already Germany is in the process of acquiring new, lighter combat vehicles and increased airlift capabilities. The German Army intends to replace its armoured infantry fighting vehicle and battle tanks with a lighter, New Armoured Platform. It is also pressing for an advanced version of its armoured personnel carrier which, with improved armour and a 20mm automatic cannon, would greatly enhance firepower and survivability.[105] Meanwhile, the German Air Force is looking for an aircraft to replace its C-160 transport fleet.[106] If the new German government decides to seek a more visible role on the world stage, that could lead to even more of a revamping of Germany's military forces towards the lighter, more mobile forces with greater firepower that are best suited for expeditionary warfare.[107]

**Organization**

44. Part of Germany's move towards an expeditionary warfare capability involves a reduction in the size of its forces. From a combined East and West German military personnel strength of 583,000 at the time of unification, the *Bundeswehr* had to shrink to 370,000 troops by the end of 1994. By the summer of 1999 these levels will have been reduced even further, to a (still significant) peacetime strength of 340,000, including the 50,000 troops for the reaction force. Some defence analysts believe that one result of the Commission's review could be a further reduction in the size

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[101] Federal Ministry of Defence, *White Paper 1994: The Security of the Federal Republic of Germany and the Bundeswehr Now and in the Years Ahead* (Abridged Version), April 1994, p. 16.

[102] Juergen Ehle, "Germany's New Security Policy," *Strategic Review* (Summer 1997), p. 60.

[103] Tigner, p. 24.

[104] "Germany's Military Future," *Defense News*, 17 August 1998, p. 14.

[105] Jack Hoschouer and George Seffers, "Main Battle Tanks' Days May Be Numbered," *Defense News*, 31 August to 6 September 1998, p. 14.

[106] Ferguson and Witt, p. 16.

[107] Taverna, p. 73.

of the Bundeswehr.[108]

45. In contrast to the organizational trends of the RMA, Germany plans to retain its system of universal conscription. This system, it is argued, shapes the character of the *Bundeswehr* and of the conscript as a "citizen in uniform."[109] "Conscription is part of the defence culture that has developed in Germany over decades. It stands for the willingness of German citizens to assume responsibility themselves for defending their polity."[110] Prior to the election Rudolf Scharping, now SPD Defence Minister, had indicated that a review of conscription would be part of any overall defence review by an SPD government.[111] Since the election, however, he has emphasized that conscription is not under review, and will be retained as a "special guarantee for keeping the army firmly embedded in [German] society."[112]

46. That said, by the year 2000, sixty percent of the German military will be professional forces.[113] Moreover, the real issue that must concern *Bundeswehr* planners is how long they can continue conscription when so many of Germany's neighbours are abandoning conscription, and so many German youth are opting for alternative service to the state in institutions such as hospitals and schools.

## AUSTRALIA AND THE RMA

47. Over the past few years, Australia has made a conscious effort to focus on the Revolution in Military Affairs, particularly as it relates to working with the United States. In October 1997, Australia and the United States agreed to intensify interaction on the "ramifications of the information revolution"—a direct reference to the US-driven RMA.[114] The stronger focus on the RMA was intended to alleviate Australian military concerns, echoed at a high level US military conference a year later, that Australia could be "left behind in the expensive, high-tech pursuit of advanced weapons and concepts".[115] In 1998 Australia and the United States created a bilateral technology committee at the three-star level to ensure better technology transfer between the US and

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[108] Barrie and Hoschouer, p. 1.

[109] Ehle, p. 60.

[110] *White Paper 1994*, p. 15.

[111] "German Opposition Challenges Conscription," *Jane's Defence Weekly*, 27 May 1998, p. 15.

[112] Lombardi, p. 5.

[113] Mercier, p. 80.

[114] Barbara Opall, "Australia, US Eye Closer Defense Relations," *Defense News*, 20 October 1997, p. 9.

[115] Air Marshall Errol McCormack, Chief Royal Australian Air Force, "Coalition Issues and Partner Perspectives: Australia," paper presented at a conference on The United States as a 21st Century Aerospace Power, Cambridge, Massachusetts, 18-19 November 1998.

Australian militaries. The move stemmed from US concerns that Australia's forces may not be able to keep up with their US counterparts unless Canberra invested more money in high-technology weapons and platforms, and advanced command, control, communications and intelligence capabilities.[116] Most recently, Australia has decided to establish a Joint Office of the RMA at Australian Defence Headquarters in Canberra. In 1999, the Office is to produce an issue paper on the Australian Defence Force's policy options for exploiting the RMA.

48. Meanwhile, Australia has confirmed the RMA as part of government policy. In *Australia's Strategic Policy*, released in December 1997, the Revolution in Military Affairs is placed at the top the Australian Defence Force's force structure development priorities.[117] The document places greatest emphasis on maximizing interoperability with the United States, and states that Australia is prepared to make significant investments to sustain interoperability as new systems are introduced.[118] Although the Policy gives a very narrow definition of the RMA, essentially equating it to the information revolution or the technology component of the RMA, subsequent sections touch on the doctrinal and organizational aspects of the RMA.

**Technology**

49. *Australia's Strategic Policy* states that Australia's first force structure development priority will be to exploit what it calls "the knowledge edge." An important part of this is developing an integrated surveillance system that will provide continuous, real-time, all-weather detection and identification of aircraft and ships in Australia's maritime approaches.[119] To this end, Australia is improving its access to space-based surveillance capabilities and, most notably, acquiring long endurance unmanned aerial vehicles.[120] This move is in line with Australia's most recent defence white paper, *Defending Australia 1994*, which specifically identified UAVs as potential surveillance and reconnaissance platforms.[121] The Royal Australian Air Force (RAAF) is considering UAVs for surveillance, electronic support and communications roles and has already joined America's *Global Hawk* unmanned spy plane program—making Australia the first international partner to do so.[122] The Royal Australian Navy and, to a greater extent, the Australian Army are also examining the

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[116] Gregor Ferguson, "US, Australia Join to Improve Hi-Tech Interoperability," *Defense News*, 10 August 1998, p. 8.

[117] *Australia's Strategic Policy* (Canberra: Department of Defence, December 1997), p. 55.

[118] Ibid., p. 48.

[119] Ibid., p. 59.

[120] Ibid., p. 60.

[121] Mark Lax and Barry Sutherland, "An Extended Role for Unmanned Aerial Vehicles in the Royal Australian Air Force," *Air Power Studies Centre Paper No. 46*, http://www.dod.gov.au/apsc/publish/paper46.htm

[122] David Mulholland, "Australia to Join US Unmanned Spy Plane Effort," *Defense News*, 13-19 April 1998, p. 1.

acquisition of UAVs to fulfil various roles.[123] The Australian Army plans to lease tactical UAVs for a major exercise in August 1999 to determine the potential utility of a surveillance and reconnaissance UAV at the brigade level.[124]

50. As for battlespace control, Australia has undertaken a major program to improve Australia's command, control, communications and intelligence capabilities. The 15-year Takari Program comprises a group of separate but related research and development projects running from 1996 to 2010. It is designed "to help the Australian Defence Force clear the fog of war by providing it with the tools designed to capture raw data, turn it into useable information and then make it available as knowledge to the right person, at the right time, in the right place and in the right format."[125] Its goal is to harmonize the Australian Defence Force's various efforts in the fields of command, control, communications, surveillance and intelligence collection.[126]

51. Australia is also taking advantage of emerging technologies in the area of precision weapons. The Australian Army is doing so as part of its new task force structure concept (see below).[127] The Air Force plans to acquire longer-range stand-off strike weapons for its F-111 strike aircraft, but the Navy has no immediate plans to buy any long-range strike weapons such as the *Tomahawk* land attack cruise missile.[128]

**Doctrine**

52. **More rapidly mobile, lethal and flexible forces.** Australia is focusing on creating more rapidly mobile and flexible ground forces equipped with the munitions and platforms to replace concentration of mass with concentration of firepower. *An Australian Army for the 21st Century*, adopted in October 1996, notes that the new security environment calls for an operational concept involving self-reliant forces with individual force elements capable of independently performing a wide variety of tasks in dispersed areas. To this end, the document outlines a new task force structure for the Australian Army. Each task force will have much greater combat potential than the current Australian brigades. Their supporting units will be fully integrated and the combat units making up each force will be structured with more firepower and mobility permanently "embedded" at every level. Each task force will also be equipped with advanced sensors and information technology,

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[123] Ibid.

[124] Gregor Ferguson and David Mulholland, "Australia to Lease UAVs for Trials," *Defense News*, 30 November to 6 December 1998, p. 14.

[125] Australian Department of Defence, Defence Science and Technology Organization, "The Takari Program," http://www.dsto.defence.gov.au/esrl/takari/takexint.html

[126] "Australia Looks to the Future in C3I," *International Defense Review*, 1 February 1998, p. 61.

[127] *An Australian Army for the 21st Century*, October 1996, http://www.dod.gov.au/army/c21army/ booktxt.htm

[128] *Australia's Strategic Policy*, p. 63.

creating a new integrated battlefield communications and information environment.[129] Their mobility will be enhanced by purchasing additional helicopters for troop lift and new armoured vehicles with improved cross-country mobility.[130] *Australia's Strategic Policy* also foresees the acquisition of further troop lift capability.[131] Finally, the task forces will be designed to operate with the combat elements of the other Services, with the ultimate aim of creating highly mobile joint task forces.[132]

53. The Australian Army's 1st Brigade is scheduled to be the first army unit to assume the independent task force structure. Operating some 100 armoured fighting vehicles and 30 helicopters, the 1st Brigade will be a more mobile and flexible formation equipped with embedded precision firepower and sophisticated communications with the ability to respond and adapt more rapidly to changing tactical scenarios. As such, it is expected to meet the challenges of high mobility and dispersed operations more effectively than the previous conventional brigade structure.[133]

54. **Unmanned combat.** Although Australia is "heading down the UAV path" in examining their use as a component of its reconnaissance and surveillance network, neither *Defending Australia 1994* nor *Australia's Strategic Policy* make any suggestion of replacing Australia's fighter aircraft with unmanned systems.[134] Rather, *Australia's Strategic Policy* outlines the requirement both to upgrade the RAAF's F/A 18 *Hornet* fighter, and to consider a replacement for the aircraft for about the 2015 timeframe.[135] Similarly, the F-111 strike aircraft is to be replaced sometime between 2010 and 2020. Australia is studying the benefits of joining the US-led Joint Strike Fighter program as an observer in order to track the Joint Strike Fighter as a potential replacement option for both aircraft.[136] Meanwhile, the RAAF has been given the go-ahead for an estimated US$147.5 million F/A 18 upgrade, ending speculation that it was considering an early replacement of the Hornet in response to increasingly stronger regional air forces equipped with new Western and Russian fighters and missiles.[137] Defence analysts had argued that in the face of these stronger air forces, the F/A 18 would be unable to carry out Australia's stated policy of establishing air superiority over the "sea-air

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[129] George I. Seffers, "Armies Investing in Systems Designed for Rapid Operations," *Defense News*, 8 June 1998, p. 12.

[130] *An Australian Army for the 21st Century*.

[131] *Australia's Strategic Policy*, p. 66.

[132] Ibid.

[133] Ian Bostock, "Australia Puts Task-Force Concept to the Test in Exercise 'Phoenix'," *Jane's Defence Weekly*, 16 September 1998, p. 17.

[134] Lax and Sutherland.

[135] *Australia's Strategic Policy*, p. 61.

[136] Gregor Ferguson, "Australia Weighs Observer Position in JSF Program," *Defense News*, 15 June 1998, p. 12.

[137] Gregor Ferguson, "Australian Air Force to Proceed with F/A 18 Upgrade," *Defense News*, 24-30 August 1998, p. 10.

gap" to the north and west of Australia.[138]

**Organization**

55. Contrary to the more common organizational trends of the RMA, which see a move towards all-professional armies, Australia's new task forces are to be manned by a mix of professional and reserve forces. *Australia's Strategic Policy* notes that full-time service is increasingly necessary to develop and maintain the specialist skills needed to operate advanced systems. But it also argues that in a more flexible labour market, where people increasingly move through different careers in their working life, reserve service can be a highly cost effective way of retaining access to skilled personnel who no longer wish to continue as part of the permanent force. Using a combination of part-time and full-time personnel is therefore a central part of the Army's restructuring plan.[139] The part-time component of the force is to be better equipped and trained than in the past, and wholly integrated with the full-time component. The proportion of full and part-time personnel in a unit will depend on its mission and readiness, but all units will contain some part-time personnel.[140]

**CONCLUSION**

56. There are many common themes to how Australia, Britain, France and Germany are responding to the Revolution in Military Affairs. The strongest area of technological focus is on battlespace awareness and control. Each of these countries is investing significantly in measures to increase its intelligence, surveillance and reconnaissance capabilities. Central to these efforts is the development or acquisition of unmanned aerial vehicles. For battlespace control the emphasis is placed on acquiring advanced command, control and communications capabilities that are not only interoperable among each nations' services but also, and perhaps more importantly, compatible with those of its allies. Each state is also acquiring at least a limited number of precision-guided munitions, whether they be for the navy, army or air force or all three services.

57. Organizationally, a key theme is the move towards more professional, highly trained personnel. Those countries that have always had a professional, volunteer regular force are placing more emphasis on this force and either reducing reserve force levels or ensuring the reserves are more highly trained to operate effectively with regular force units. They are also halting—if not reversing—reductions in their regular force levels. Those countries that have relied on a large conscript military are reducing personnel levels significantly and either eliminating conscription or, at a minimum, ensuring their rapid reaction forces are made up of professional service personnel.

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[138] John Stackhouse, "Australia Pushes Through Hornet Upgrades," *Jane's Defence Weekly*, 2 September 1998, Vol. 30, No. 9.

[139] *Australia's Strategic Policy*, pp. 48-49.

[140] *An Australian Army for the 21st Century*.

All countries are reorganizing their professional forces into smaller units that are "modular" in the sense that they can easily be combined with other units to make up a force that is tailored to the particular task at hand.

58. Doctrinally there is a clear indication that one of the most "futuristic" predictions of the RMA—a move towards unmanned combat using unmanned combat aerial vehicles—is not likely to be borne out in the period to about 2020/2025. Rather, all are planning to either purchase new strike aircraft or upgrade their current capabilities. That said, they are also "hedging their bets" by reducing the number of manned aircraft they purchase and tendering contracts to determine the feasibility of unmanned combat vehicles in the future.

59. All countries are showing a strong interest in improving the ability of their services to work together and, especially, to operate with other allies. Jointness and combinedness are seen as key requirements for the new international security environment. The nature of regional crises is such that armies, navies and air forces often need to cooperate. Equally—if not more—important, armies need to be able to operate with other armies, navies with other navies and air forces with other air forces. The emphasis on acquiring advanced command, control and communication capabilities is driven primarily by the imperative of being able to work with allies. The move to create units that can be easily brought together and tailored for a specific task is meant to facilitate jointness.

60. Perhaps the most significant doctrinal theme—and the one that is driving many technological and organizational changes, as well some doctrinal developments—is the creation of lighter, more rapidly mobile yet lethal forces that are better suited to responding to the unpredictable threats and risks of the new international security environment. Britain, France and Germany are all creating expeditionary forces that can be rapidly deployed to regional crises. Australia is undergoing the same process with the defence of their vast northern territory in mind. The focus on battlespace awareness is to large degree meant to increase the ability of these forces to operate in regional contingencies. The acquisition of precision-guided munitions is often with a view to increasing the lethality of an expeditionary force's relatively smaller units so that they are as powerful or more powerful than the larger units of yesterday. Other key equipment trends, such as the reduction in main battle tanks and the increase in strategic lift capabilities, are also prompted by the goal of creating an effective expeditionary capability. So too are the emphasis on jointness and combinedness, and the move towards professional forces.

61. Expeditionary doctrine is driven by the view that most conflicts in the foreseeable future will be regional contingencies ranging from humanitarian missions to near-combat peace enforcement operations. Thus while there is a common perception that measures to pursue the Revolution in Military Affairs are unsuited or irrelevant to the kinds of missions Western forces are most likely to face in the coming decades, in fact the opposite is true. Australia, Britain, France and Germany are all placing significant emphasis on furthering those aspects of the RMA that are best suited to the nature of the new international security environment.

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This paper looks at the British, French, German and Australian approaches to the US-driven Revolution in Military Affairs (RMA). It concludes that there are many common themes to how these countries are responding to the RMA. Technologically, all countries are investing in unmanned aerial vehicles for intelligence and reconnaissance; advanced, interoperable command, control and communications capabilities, and precision-guided munitions. Organizationally, all are creating a more professional, highly trained force Those countries with professional forces are reducing reserve levels, increasing their training and reversing reductions in regular force levels. Those countries with conscript militaries are reducing personnel levels and eliminating or drawing back conscription Doctrinally, all countries are emphasizing increased jointness and combinedness, as well as lighter, more rapidly mobile yet lethal forces. These moves are designed with a view to creating an expeditionary capability that can respond effectively to the unpredictable threats and risks of the coming decades Thus while there is a common perception that measures to pursue the RMA are unsuited or irrelevant to the kinds of missions Western forces are most likely to face, in fact the opposite is true. Britain, France, Germany and Australia are all investing in those aspects of the RMA that are best suited to the nature of the new international security environment.

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